Commercialization Results and Plans (1992-1996)

Regarding Pressure Sensitive Paints
developed from
NASA Joint Sponsored Research Agreement #6
AmTech Project # 9301

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prepared by
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Purpose

This report defines the nature of commercialization of "pressure sensitive paints" technology developed through the Joint Sponsored Research Agreement #6. Based on this definition, the report will describe the results to date (1993-1995) of commercialization, and planned commercial uses (1996+) which will result from the extension of the JSR6 agreement.

Scope

The scope of the JSR6 is to develop pressure sensitive paints which, when used as a sensor with other technologies, can generate new and more comprehensive data for a variety of industrial and health pressure measurement needs. The sensors are owned by the University of Washington as the R&D participant in the project. As such, this report will focus on the commercialization of the sensors by the University of Washington, with Boeing Commercial Airplane Co. as the first of several direct users of the sensor technology.

There are three related issues which will affect the long term commercial potential of the technology, but are outside the scope of the JSR 6 agreement. First, the sensors are used to generate images which are captured via special "imaging systems" and converted to data which is analyzed by customized software programs. Neither the imaging system nor the software are directly under development in the JSR 6 agreement. Image capture systems are under development independently at potential users. Software analysis programs are under development at NASA and private corporations.
The success of developing these systems has a direct bearing on the commercialization of the sensors.

Second, the University of Washington has made efforts to license the technology to users in different industries. However, the information regarding the intention of the non-aeronautics industry users is limited by their confidentiality agreements with the University of Washington. Therefore, only summary descriptions of various commercial applications can be provided, with the exception of those actions by Boeing Commercial Airplane Co.

Third, the U.S. Government via NASA and the Air Force has expressed interest in using the sensors in the course of wind tunnel tests which are run for corporations which are designing commercial aircraft. The U.S. Government would be reimbursed by the commercial users for such tests. Use of the sensors for such "commercial tests" is outside the scope of the R&D and government mission purposes license which the University of Washington has issued to the Federal Government. This report does not contain any information about the intent of the Federal Government to negotiate a commercial use license from the University of Washington.

Commercialization Model

The description of the commercialization results to date and plans are based on the commercialization model used by the American Technology Initiative (AmTech) for this project. The model include the following components:

Technology Defined- Technology is defined as knowledge which has been developed and is applied to a given use.

Commercialized Technology- Technology which has been applied to a use by non-Federal Government buyers in the U.S. economy: for profit corporations, non-profit corporations, academic institutions, state and local governments, and special purpose organizations, e.g. water districts, joint ventures, etc.

Application of Technology- The application of technology can be to create:

- New products, processes or services

- Enhanced products, processes or services

Commercial Application- The commercial application of a technology is the use, by a non-Federal Government buyer to create or enhance a product, process or service.

Purposes and Impacts- The wide range of buyers creates an equally wide range of purposes and impacts, from "generating profits" to improving process controls, to strategic positioning. The Federal Government's policy objectives in a JSR Agreement, including cost savings and job formation, can only be measured by conducting a survey of the potential end users. Commercialization is defined solely as the decision, by a non-Federal Government user to utilize the technology on a "purchases" basis. It does not cover the description of purposes or measurement of impacts.

Commercialization Results to Date: Year End 1995

The commercialization efforts to date (1992-1995) have focused on two actions: first, securing customers via licenses in end user industries that must generate pressure data and second, identifying existing or new companies which will offer the service or instrumentation of pressure measurement to various customers, with the paint as only one component of the system.

A commercialization plan was developed in 1992-1993, based on market research, to target the aerospace industry, both fixed winged and rotorcraft, as potential licensees for the technology. Direct solicitation was made to15 potential aerospace industry customers. Participation in the JSR and a commercial use license were offered to all potential participants. Separately, the University of Washington made arrangements to provide consulting to the participants regarding the options for securing imaging systems and developing customized, analytic software. This plan failed to generate parties interested in either the JSR or the commercial license for two reasons. First, most of the participants are government contractors, and realized that the Federal Government would eventually expose their company to the technology in the context of Government contracts. Second, the Federal Government declared its intent to offer the technology via a bundled price in wind tunnel tests, essentially becoming the "commercial" vendor of the integrated system. Boeing Commercial Airplane Co. has expressed interest in a license, and is currently negotiating the scope and cost of such a license. Boeing intended commercial application is described in the next section.

A modified commercialization plan was adopted in 1992-1993, to target either "paint companies" or new companies which would produce the instrumentation necessary to utilize the paints technology. Based on this plan, the University contacted and retained a "paint supplier" company to participant in the project. This company, however, has not expressed interest to date in licensing the rights to manufacture and sell the paints as sensors. Separately, a graduate student which worked under the JSR 6 has formed a new company to develop and sell the instrumentation necessary to generate the pressure data. The company, PhotoSense, Inc. of Longmont, Colorado, intends to buy the paints and interpretive software from third party sources, and act as an instrumentation servicing company for at least three industries: health care, manufacturing, and aerospace. PhotoSense objective is to develop a new line of pressure measurement products and services, previously unavailable in the United States. PhotoSense is currently negotiating a license arrangement with the University of Washington in return for 10% equity in the new company.

Planned Commercial Uses 1996+

Future commercialization plans are targeted at three areas. First, the University of Washington will continue to limit publication of the results, and offer the technology publicly on a licensed basis only. However, to date, the University has no revenue from the technology, and limited resources to continue patent protection. There are no specific plans by the University to continue and expand patent protection. Second, PhotoSense, Inc., plans to hire additional personnel from the UW team, and develop customized systems for different pressure measurement needs. PhotoSense has supplied the University with a summary of its proprietary business plan. In general, that plan calls for the company to target two initial industries: health care and aerospace. The health care industry will utilize the paints to measure pressure in the body cavities of patients as a diagnostic tool. The paints will be applied to the end of a thin, fiber optic cable which is inserted into the body to measure pressure. The aerospace industry will utilize the paints to measure pressure and other surface conditions which will affect aircraft performance.

Third, Boeing Commercial Airplane Co. will utilize the paint technology to achieve three objectives:

Enhanced process- Replace Pressure Taps- The technology can reduce the use of pressure taps, which will reduce costs and time necessary to undertake the tests.

Enhanced process- Shorten Cycle Time- The technology permits a wider range of model designs to be measured in a given set of wind tunnel runs. This will shorten the overall cycle time for aircraft design.

Improved product- Better Performance Data- The technology will generate more comprehensive aerodynamic performance data, which Boeing can translate into features of aircraft under design.

Significance of the NASA Joint Sponsored Research Agreement #6 Extension

The JSR 6 extension will permit continued work on a range of paints which can meet multiple end user market needs. The University of Washington continues support the work through reduced overhead, and is seeking to add new “paint formulations” to its portfolio of intellectual property. The increased portfolio will enhance the University’s ability to license the technology to both end users and intermediate instrumentation companies.